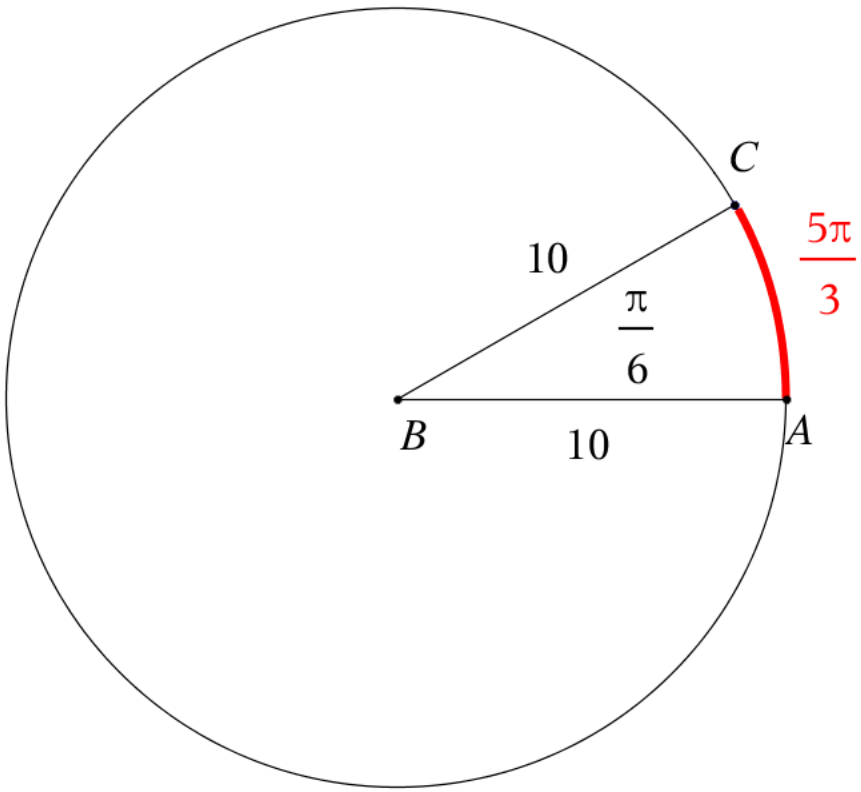


Scenario 2: Arc Length

Known: r = 10

$$\theta = \frac{\pi}{6}$$

$$s = \theta \cdot r$$

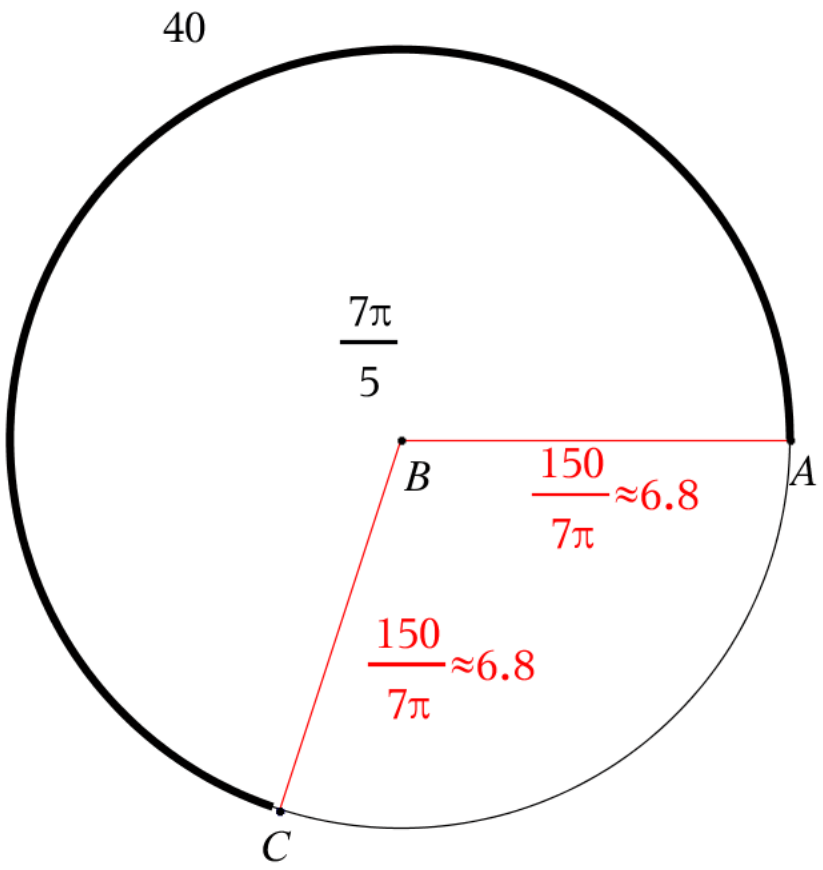
Want θ

1) Write equation

$$s = 10 \cdot \frac{\pi}{6} = \frac{10 \cdot \pi}{6} = \frac{5 \cdot \pi}{3}$$

$$s = \frac{5\pi}{3}$$

NOTE $\theta = \frac{\pi}{6} \cdot \frac{180}{\pi} \approx 30°$



Scenario 3: Arc Length

Known: $\theta = \frac{7 \cdot \pi}{5}$

$s = 30$

$s = \theta \cdot r$

Want r

1) Write equation

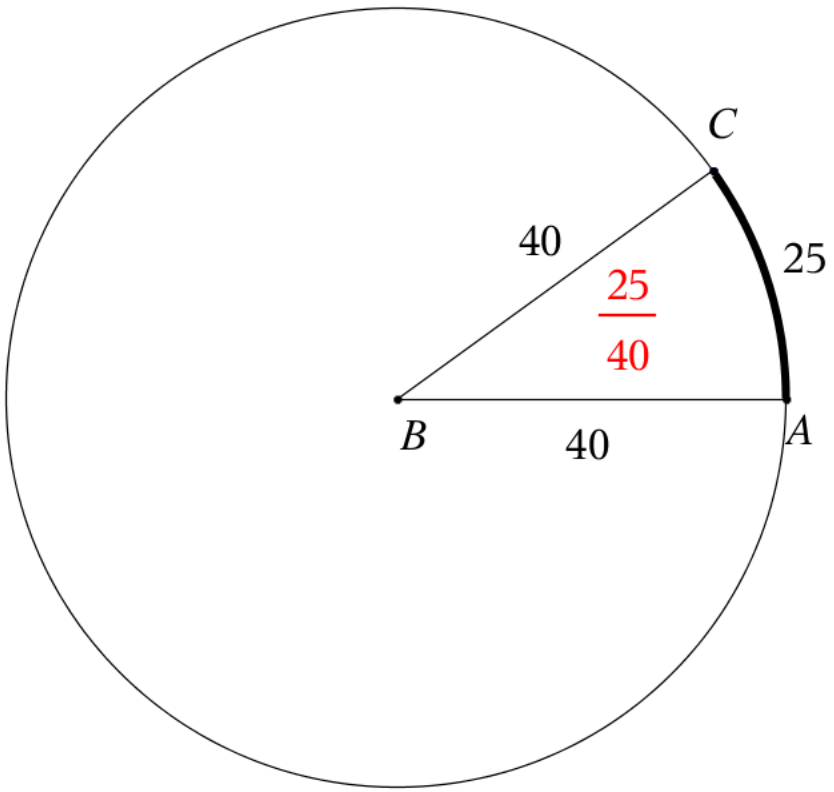
$30 = \frac{7 \cdot \pi}{5} \cdot r$

2) Solve equation

$\frac{30}{1} \cdot \frac{5}{7 \cdot \pi} = \frac{7 \cdot \pi \cdot r}{5} \cdot \frac{5}{7 \cdot \pi}$

$r = \frac{150.}{7 \cdot \pi} \approx 6.821$

NOTE $\theta = \frac{18 \cdot \pi}{40} \cdot \frac{180}{\pi}°$



Scenario 4: Arc Length

Known: r = 40

s = 25

$s = \theta \cdot r$

Want θ

1) Write equation

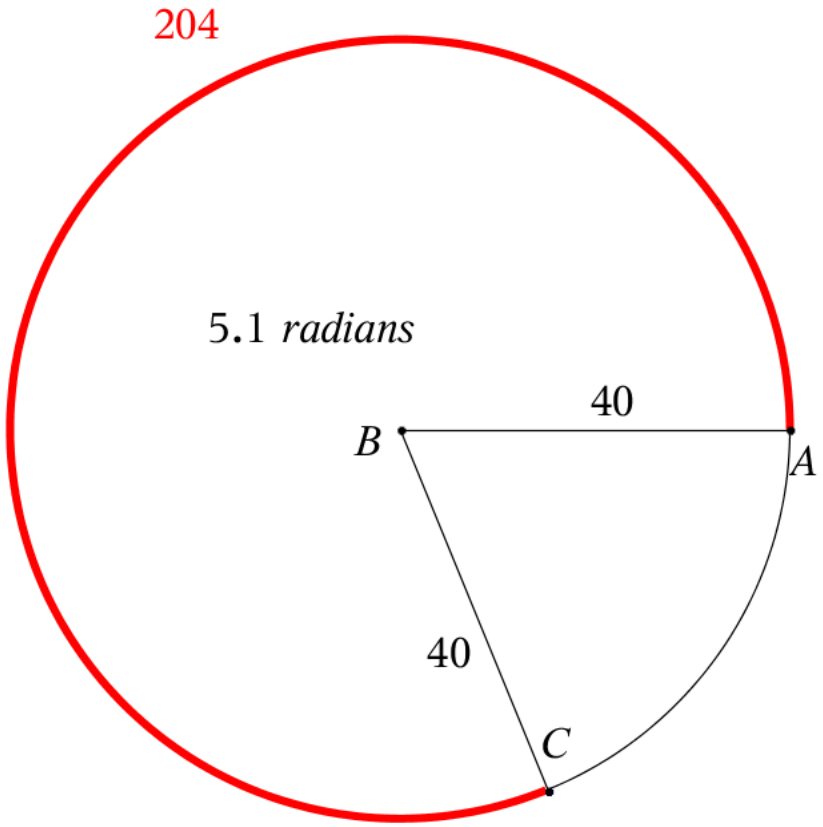
$25 = 40 \cdot \theta$

2) Solve equation

$$\frac{25}{40} = \frac{40 \cdot \theta}{\theta}$$

$$\theta = \frac{25}{40.} = 0.625 \text{ radians}$$

NOTE $\theta = \frac{25}{40} \cdot \frac{180.}{\pi} \approx 35.81\,^\circ$



Scenario 5: Arc Length

Known: r = 40

$\theta = 5.1$ *radians*

$s = \theta \cdot r$

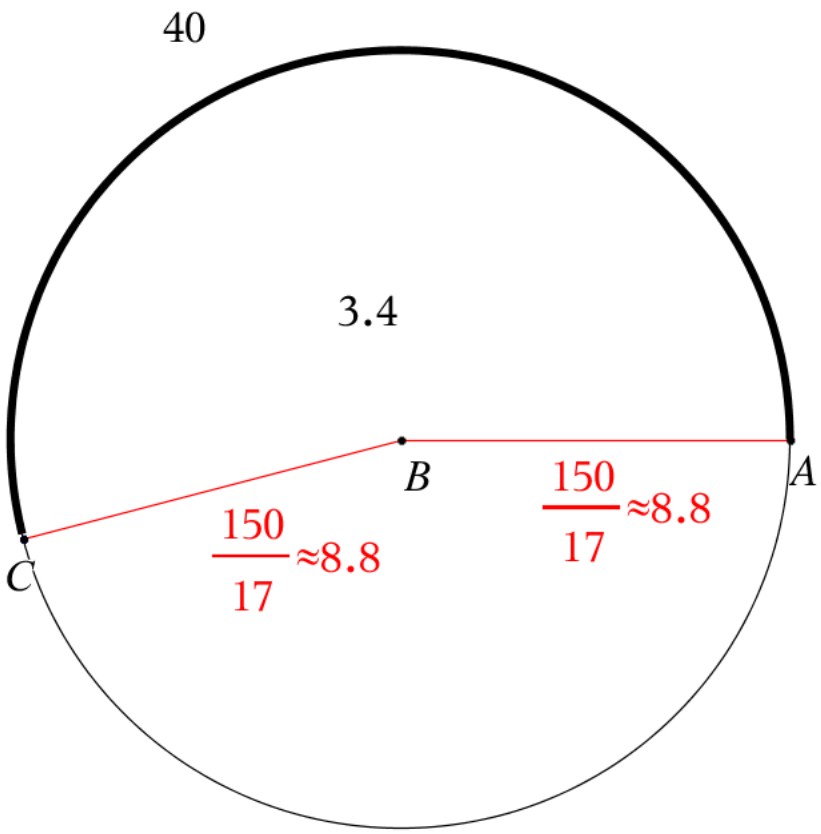
Want θ

1) Write equation

$s = 40 \cdot 5.1 = 204$

$s = 204$

NOTE $\theta = 5.1 \cdot \frac{180}{\pi} \approx 292.2°$



Scenario 3: Arc Length

Known: $\theta = 3.4$

$s = 30$

$s = \theta \cdot r$

Want r

1) Write equation

$30 = 3.4 \cdot r$

2) Solve equation

$$\frac{30}{3.4} = \frac{3.4 \cdot r}{3.4}$$

$$r = \frac{30.}{3.4} = \frac{150}{17} = 8.824$$

NOTE $\theta = 3.4 \cdot \frac{180}{\pi} \approx 194.8°$

$122+\frac{56}{60}+\frac{14}{3600}$ $\frac{221287}{1800}$

$\frac{221287}{1800.}$ 122.9

DMS to DECIMAL DEGREES

KNOW

1 degree = 60 minutes

1 degree = 3600 seconds

1) convert parts to degrees

2) add the parts

$122°56'14" = 122+\frac{56}{60}+\frac{14}{3600}$

$122°56'14" = \frac{221287}{1800}$

$122°56'14." \approx 122.9°$

(78.549)▸DMS 78°32'56.4"

78.549° to DMS

Step 1 find the decimal minutes

Step 2 convert decimal minutes to seconds

Step 3 write DMS

Step 1)

0.549° =0.549·60 ▸ 32.94

78.549°→78°32.94'

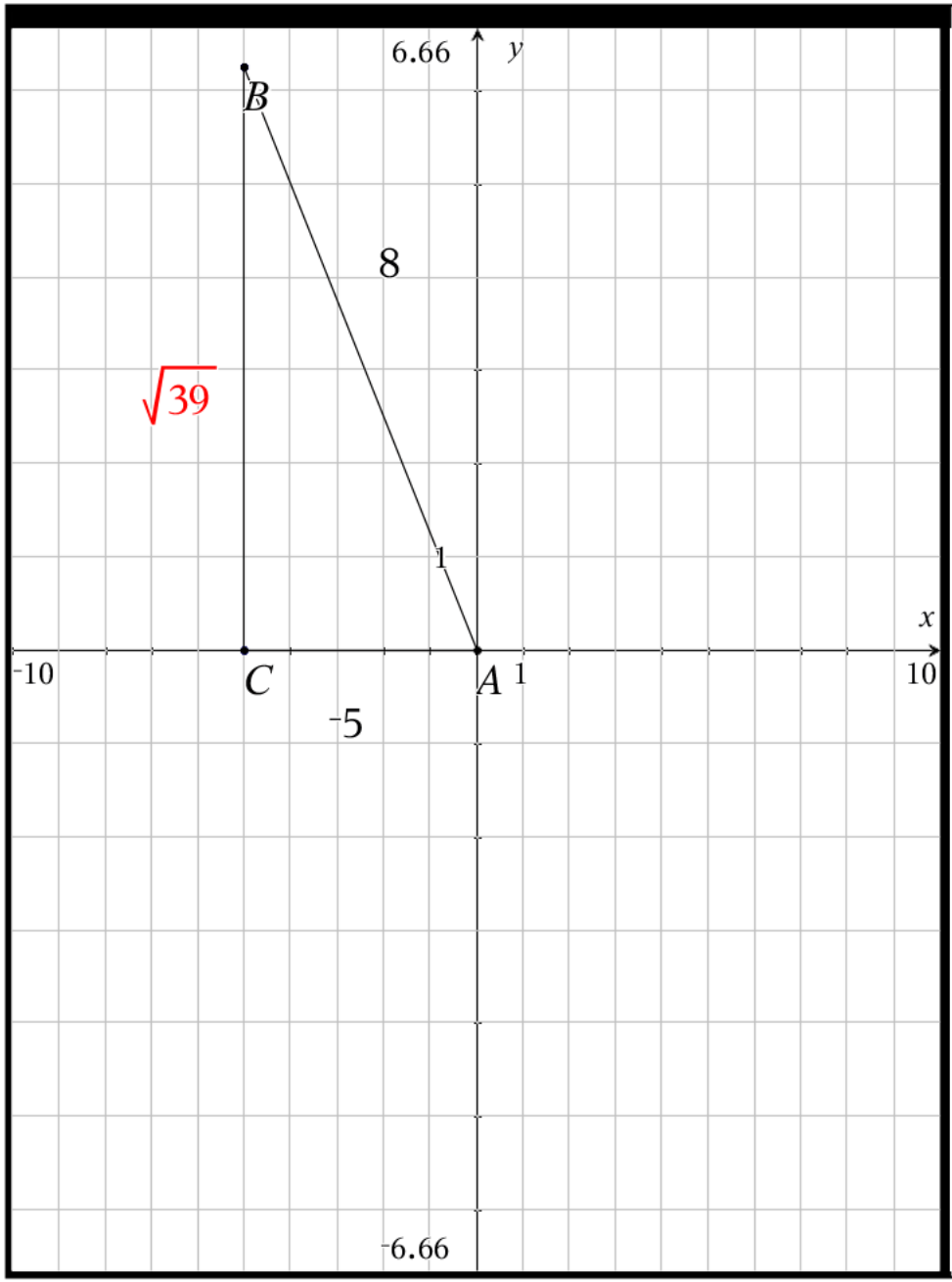
Step 2)

0.94·60 ▸ 56.4

78°32.94'→78°32'56.4"

OR Step 1 FIND the button

(78.549)▸DMS ▸ 78°32'56.4"



Given sec x $= \frac{-8}{5} = \frac{8}{-5}$ and $\frac{\pi}{2} < x < \pi$

This is a Q2 angle ASTC applies

First we know

HYPOTENUSE IS ALWAYS POSITIVE

sec x $= \frac{hyp}{adj} = \frac{8}{-5}$

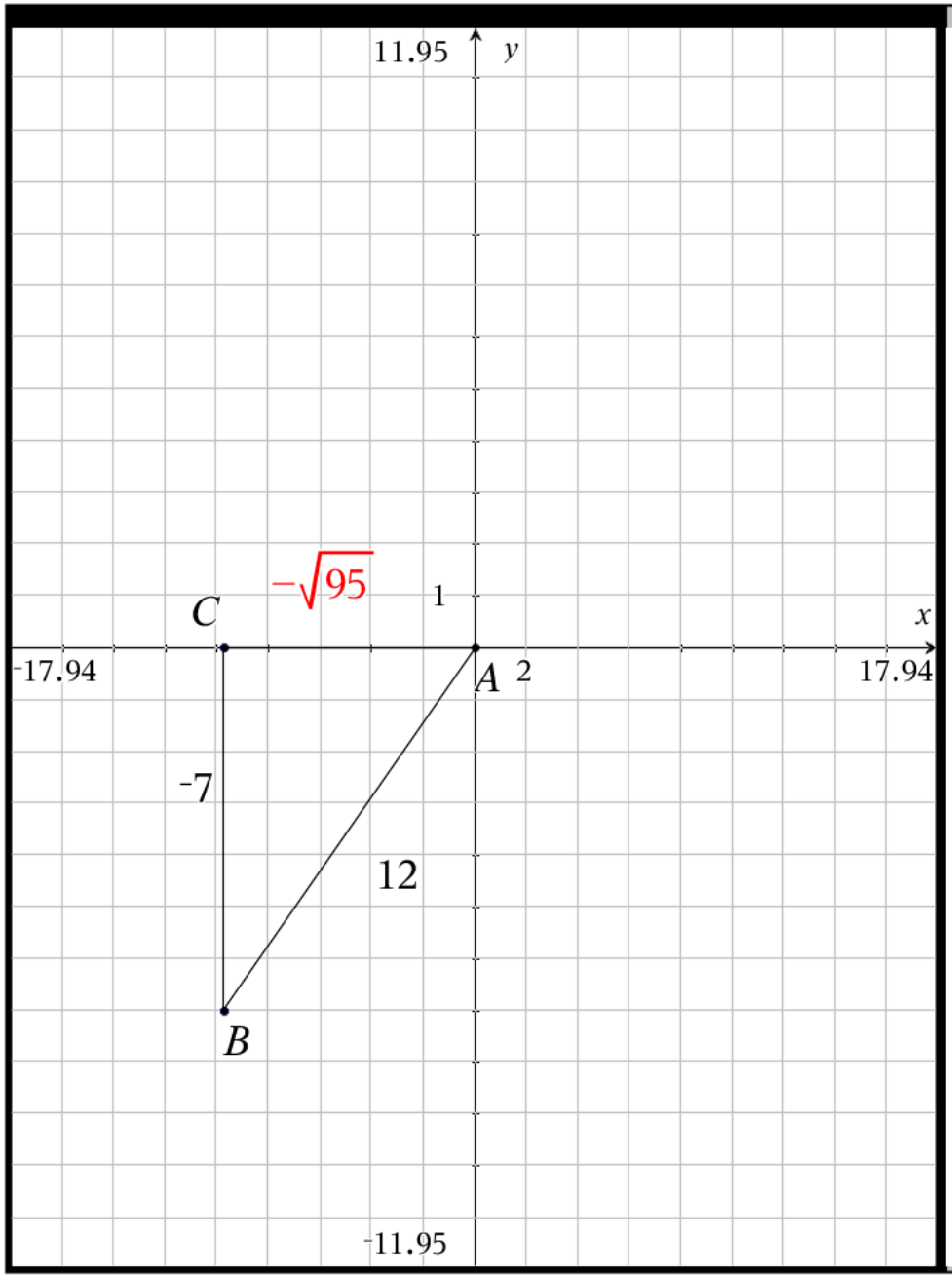
we find opp $= \pm\sqrt{8^2 - 5^2} = +\sqrt{39}$

($+\sqrt{39}$ because y > 0 in Q2)

sin x $= \frac{\sqrt{39}}{8}$ cos x $= \frac{-5}{8}$ tanx $= \frac{\sqrt{39}}{-5}$

cot x $= \frac{-5}{\sqrt{39}} = \frac{-5 \cdot \sqrt{39}}{39}$

csc x $= \frac{8}{\sqrt{39}} = \frac{8 \cdot \sqrt{39}}{39}$



Given csc x $=\frac{-12}{7}=\frac{12}{-7}$ and $\pi < x < \frac{3\pi}{2}$

This is a Q3 angle ASTC applies

First we know

HYPOTENUSE IS ALWAYS POSITIVE

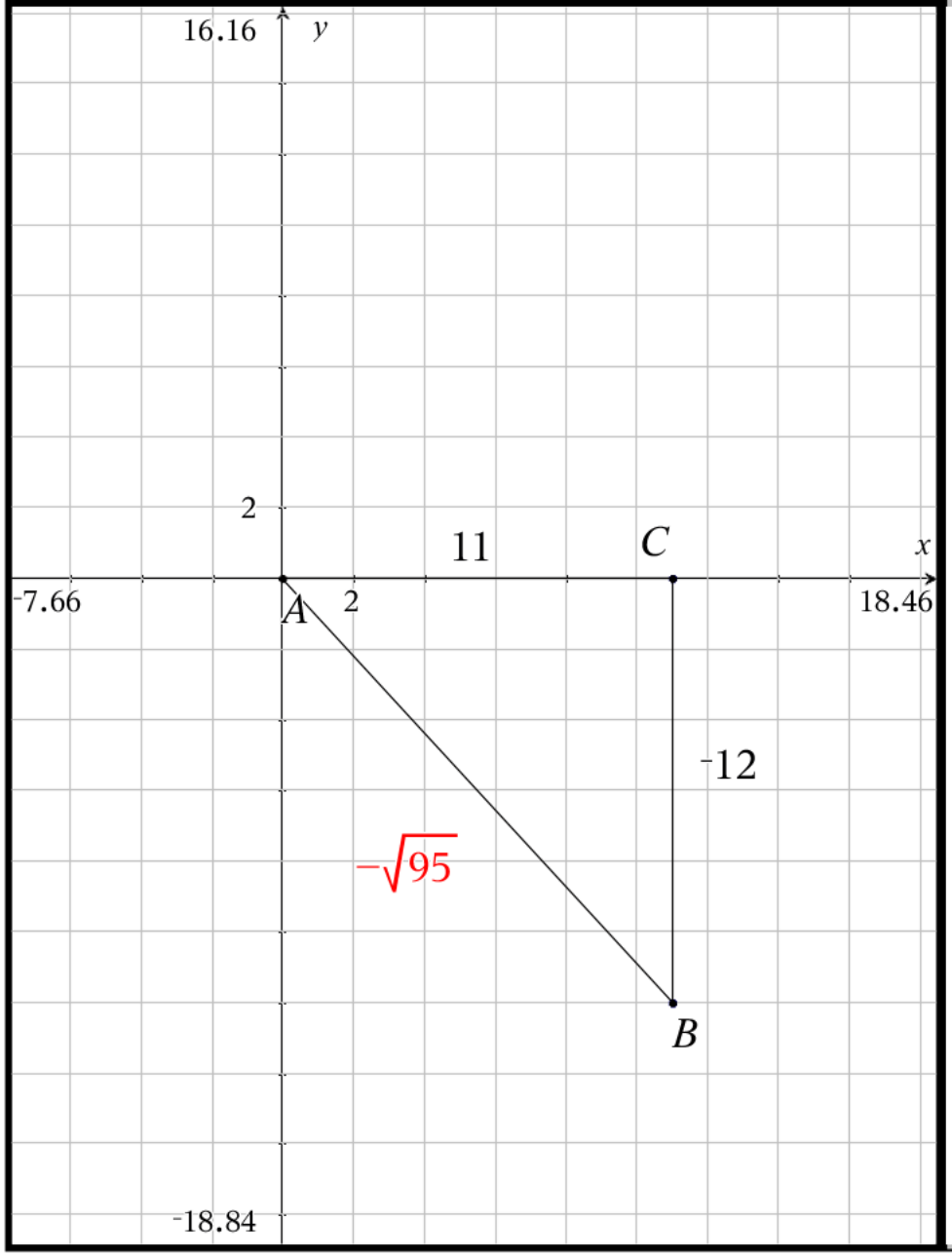
csc x $=\frac{hyp}{opp}=\frac{12}{-7}$

we find adj $=\pm\sqrt{12^2-7^2}=-\sqrt{95}$

($-\sqrt{95}$ because y < 0 in Q3)

sin x $=\frac{-7}{12}$ cos x $=\frac{-\sqrt{95}}{12}$ tanx $=\frac{-7}{-\sqrt{95}}=\frac{7\cdot\sqrt{95}}{95}$

cot x $=\frac{-\sqrt{95}}{-7}=\frac{\sqrt{95}}{7}$ sec x $=\frac{12}{-\sqrt{95}}=\frac{-12\cdot\sqrt{95}}{95}$



Given cot x $= \frac{-11}{12} = \frac{11}{-12}$ and $\frac{3\pi}{2} < x < 2\pi$

This is a Q4 angle ASTC applies

First we know

HYPOTENUSE IS ALWAYS POSITIVE

csc x $= \frac{hyp}{opp} = \frac{12}{-7}$

we find hyp $= \sqrt{12^2+11^2} = \sqrt{265}$

($\sqrt{265}$ because hyp > 0)

sin x $= \frac{-12}{\sqrt{265}} = \frac{-12\cdot\sqrt{265}}{265}$

cos x $= \frac{11}{\sqrt{265}} \rightarrow \frac{11\cdot\sqrt{265}}{265}$ tanx $= \frac{-12}{11}$

csc x $= \frac{-\sqrt{265}}{12}$ sec x $= \frac{\sqrt{265}}{11}$